

We claim:-

1. A process for the production of leather, comprising at least two of the following process steps A) to D):

A) use of one or more polyelectrolytes in the production of semifinished products or intermediate products, comprising at least one of the steps (a) to (d)

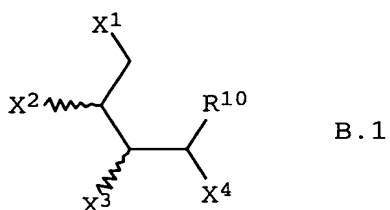
(a) addition of one or more polyelectrolytes and from 0 to 1.5% by weight, based on the salted weight, of lime, immediately before or during liming,

(b) addition of one or more polyelectrolytes before or during deliming,

(c) addition of one or more polyelectrolytes before or during bating,

(d) addition of one or more polyelectrolytes and, altogether, from 0 to 3% by weight, based on the pelt weight, of alkali metal or alkaline earth metal salt, immediately before or during pickling;

B) treatment of the hides during liming in aqueous liquor with one or more compounds of the formula B.1



or the corresponding alkali metal, alkaline earth metal, ammonium or phosphonium salts thereof,

where:

77

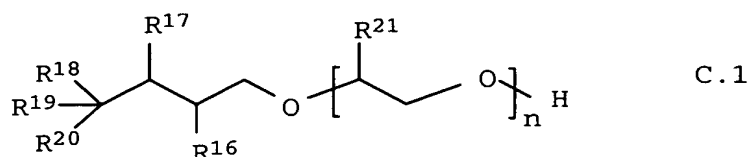
R<sup>10</sup> is hydrogen or C<sub>1</sub>-C<sub>12</sub>-alkyl which is unsubstituted or substituted by one or more mercapto or hydroxyl groups,

X<sup>1</sup> to X<sup>4</sup>, independently of one another, are hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, hydroxyl, mercapto or NHR<sup>11</sup> and

R<sup>11</sup> is hydrogen, C<sub>1</sub>-C<sub>12</sub>-alkyl, formyl or C<sub>1</sub>-C<sub>4</sub>-alkylcarbonyl,

with the proviso that at least two mercapto groups are contained in the compound or the compounds B.1;

C) use of degreasing agents of the formula C.1



for degreasing pelts, hides or other intermediate products and semifinished products in leather production,

where:

R<sup>16</sup> to R<sup>19</sup>, independently of one another, are hydrogen or branched or straight-chain C<sub>1</sub>-C<sub>10</sub>-alkyl,

R<sup>20</sup> is hydrogen or C<sub>1</sub>-C<sub>25</sub>-alkyl,

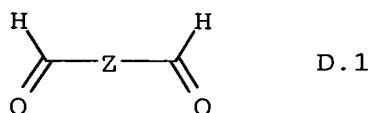
R<sup>21</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl and

n is an integer from 1 to 100,

R<sup>16</sup> corresponding to C<sub>1</sub>-C<sub>10</sub>-alkyl when R<sup>18</sup> to R<sup>20</sup> are each hydrogen

and at least one of the radicals R<sup>18</sup> to R<sup>20</sup> corresponding to C<sub>1</sub>-C<sub>25</sub>-alkyl when R<sup>16</sup> is hydrogen;

D) tanning with the use of a tanning agent which can be prepared by reacting at least one aldehyde of the formula D.1,



78

with at least one further identical or different aldehyde of the formula D.1,

where:

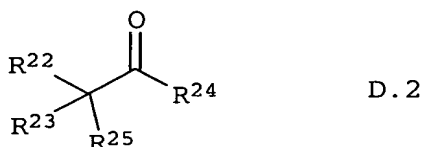
5

Z is a single chemical bond, unsubstituted or substituted C<sub>1</sub>-C<sub>12</sub>-alkylene, unsubstituted or substituted C<sub>5</sub>-C<sub>12</sub>-cycloalkylene or unsubstituted or substituted C<sub>6</sub>-C<sub>14</sub>-arylene,

10

the reaction being carried out in the presence of an acidic catalyst and optionally in the presence of at least one further carbonyl compound of the formula D.2

15



20

where:

R<sup>22</sup> to R<sup>25</sup>, independently of one another, are hydrogen, unsubstituted or substituted C<sub>1</sub>-C<sub>12</sub>-alkyl, unsubstituted or substituted C<sub>3</sub>-C<sub>12</sub>-cycloalkyl, unsubstituted or substituted C<sub>7</sub>-C<sub>13</sub>-aralkyl or unsubstituted or substituted C<sub>6</sub>-C<sub>14</sub>-aryl,

25

30

with the proviso that at least one further aldehyde of the formula D.1 in which Z contains α-hydrogen atoms, or at least one further carbonyl compound of the formula D.2, is present when Z corresponds to a single chemical bond or to a radical without α-hydrogen atoms.

2. A process as claimed in claim 1, comprising at least the process steps A) and B).

35

3. A process as claimed in claim 1, comprising at least the process steps A), B) and C).

4. A process as claimed in claim 1, comprising the process steps A) to D).

40

5. A process as claimed in claim 2, 3 or 4, wherein at least the step (a) is contained in process step A).

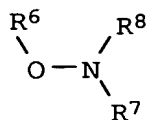
45

## 79

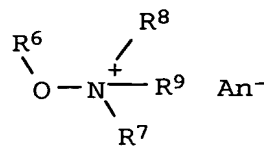
6. A process as claimed in one or more of the preceding claims, wherein no lime (0% by weight of lime) is used in step (a) of process step A).

5 7. A process as claimed in one or more of the preceding claims, wherein one or more hydroxylamine compounds of the formula A.15.a or A.15.b

10



A.15.a

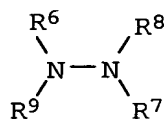


A.15.b

15

or one or more unprotonated or protonated hydrazine compounds of the formula A.16

20



A.16

25

are additionally introduced in step (a) of process step A),

where:

30

$\text{R}^6$  to  $\text{R}^9$ , independently of one another, are hydrogen,  $\text{C}_1$ - $\text{C}_{20}$ -alkyl or  $\text{C}_6$ - $\text{C}_{14}$ -aryl and

$\text{An}^-$  is halide, sulfate, hydrogen sulfate, phosphate, hydrogen phosphate or dihydrogen phosphate or a mixture of said anions.

35

8. A process as claimed in claim 7, wherein hydroxylamine is added in step (a) of process step A).

40

9. A process as claimed in one or more of claims 5 to 8, wherein alkali metal hydroxide and/or alkali metal carbonate are additionally used in step (a) of process step A).

45

10. A process as claimed in one or more of claims 5 to 9, wherein the process water obtained after combination of process step A) (a) and process step B) and substantially freed from the organic components, in particular from proteins and any hairs, is used at least partly in at least one further step

of process steps A) (b) to A) (d), C) and D) for the production of leather and/or for the presoak and main soak of the rawhides.

5 11. A process as claimed in claim 10, wherein the process water  
obtained after combination of process step A) (a) and process  
step B) and substantially freed from the organic components,  
in particular from proteins and any hairs, is used at least  
partly in step (b) of process step A) and/or in process step  
10 D) and/or for the presoak and main soak of the rawhides.

12. A process water substantially freed from organic components,  
in particular from proteins and any hairs, obtainable after  
combination of process step A) (a) and process step B) by a  
15 process for the production of leather as claimed in one or  
more of claims 5 to 9.

13. A leather which has been produced by a process as claimed in  
one or more of claims 1 to 11.

20

25

30

35

40

45